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Effect of Laughter Yoga on Military Graduate Students: A Pilot Study

Lt Col Jacqueline M Killian, PhD

Nurse Scientist, 59MDW/ST

JBSA-Lackland

Laughter Yoga USA National Conference

October 26-28, 2018



DISCLAIMER

The views expressed are those of the author and do not reflect the official views or policy of the Department of Defense or its Components. Furthermore, the voluntary, fully informed consent of subjects used in this research was obtained as required by 32 CFR 219 and DODI 3216.02_AFI 40-402.

DISCLOSURE

This research was funded in part by the Jonas Center for Nursing and Veterans Healthcare and the Uniformed Services University of the Health Sciences.

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UNIFORMED SERVICES UNIVERSITY
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JONAS CENTER
FOR NURSING AND
VETERANS HEALTHCARE

Improving Healthcare Through Nursing

Agenda

- Background & Significance
- Specific Aims
- Methods
- Results
- Conclusions
- Questions

Stress & Psychological Health of US Military Members

- 27.4 % active duty AF personnel report significant job stress
 - Nearly half reported symptoms of depression
 - 2/3 report work stress adversely impacts physical health
- Mental health care data (2014 Medical Surveillance Monthly Report)
 - Account for 44% hospital days
 - 18.8% medical encounters
 - 21.7% lost work time

Stress & Psychological Health of US Military Members

- 60% military and veterans report some form of debt
- 80% military report frequent moves create financial hardship

Problem

High levels of stress lead to physical and mental health concerns that can negatively impact one's productivity and ability to accomplish the mission.

New, innovative treatment options are needed to mitigate the effects of stress.

Laughter Yoga

A Biobehavioral Intervention

Laughter Yoga Explained

- Form of yogic breath work
- Ha Ho sounds with exhalation
- Chanting and deep slow breaths
- Accomplished in group setting with playfulness



Health Benefits of Laughter Yoga

- Improves blood pressure
- Decrease stress, negative affect, anxiety and depression

(Nagendra, et.al., 2007; Weinberg, et.al., 2013; Shahidi, et.al., 2010; Nalini, et.al., 2014; Farifteh, et.al., 2014;)

- Improves mood
- Increases positive affect, self-efficacy, self-regulation, optimism, positive emotions, social identification and life satisfaction

(Beckman, Regier & Young, 2007; Shahidi, et.al., 2010; Dolgoff-Kaspar, et.al., 2012)

Theoretical Framework

Psychological Stress & Coping Theory ~ Lazarus & Folkman



Figure 3. Transactional Model of Stress (Lazarus & Folkman, 1984).

Broaden and Build Theory ~ Dr. Barbara Frederickson

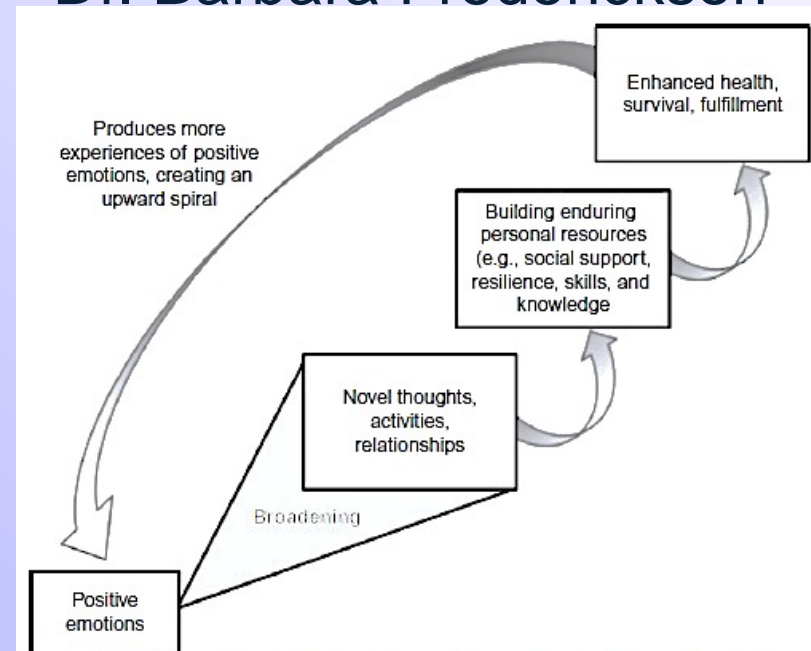
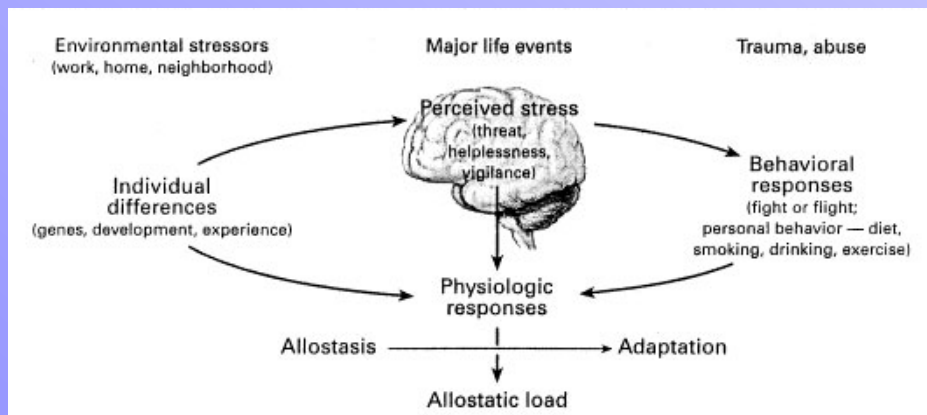


Figure 1.1 The broaden-and-build theory of positive emotions. Adapted from Fredrickson and Cohn (2008, Fig. 48.1)

Stress Response / Allostatic Load Model ~ McEwen



Theorized Physiologic Effect of LY: HRV and Peak Expiratory Flow Rate

- Slow deep breathing & diaphragmatic activity stimulates the parasympathetic nervous system
- Controlled breathing has been shown to affect the autonomic nervous system and heart rate variability
- Slow deep breathing work enhances parasympathetic nervous system activity, increases vagal tone and heart rate variability
- LY causes changes in breathing pattern due to laughter and interspersed deep slow breath work

Purpose

The purpose of this pilot investigation is to examine the impact of the biobehavioral intervention, laughter yoga on:

physiologic state

perceived stress

affect

general health and resilience

in a military graduate student population

Specific Aims

- 1.** Explore the impact of LY on the physiologic measures of heart rate variability and peak expiratory flow rate.
- 2.** Explore the impact of LY on participants' perceived stress, affect, general health and resilience.
- 3.** Describe the participant's experience of engaging in LY.

Design

Experimental pretest posttest wait-listed group design

	T 1	Wk 1	Wk 2	T 2	Wk 3	Wk 4	T 3
	Baseline			Mid-Study			End of Study
Experimental Group	X	LY	LY	X	—	—	X
Wait-listed Control (WLC) Group	X	—	—	X	LY	LY	X

X = Measurement Point; LY = Laughter Yoga

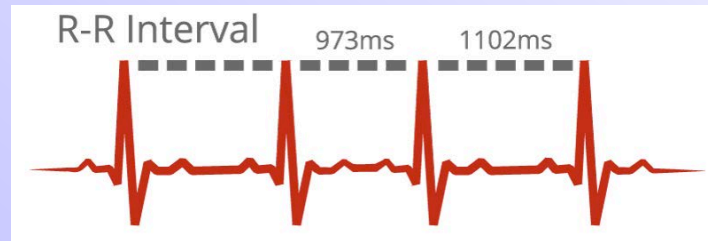
Intervention Period

- 2 LY session / week X 2 weeks = 4 sessions
- Scripted sessions
- Same session format for all sessions

Data Collection

Physiologic Measures

- Heart rate and Heart Rate Variability



- Peak Expiratory Flow Rate (PEFR)
- 3 PEFR documented at each measurement time-point and before and after each session

Data Collected at:

- Baseline > 2 weeks > 4weeks (end of the study)
- Pre and Post LY session

Data Collection

Self Report Instrument

Reliability & Validity

Instrument	Construct	Reliability & Validity (Cronbach's alpha)	Uses
Perceived Stress Scale	Perceived Stress	.76	Student, Adult & Patient Populations
Positive Affect Negative Affect Scale	Affect	.89 for PA .85 for NA	Student, Adult & Patient Populations
PHQ8	Psychological Health Symptoms of Depression	.89	Adult Primary Care
SF 36	General Health	.63-.93	General & Specific Populations
Connor Davidson Resilience Scale	Resilience	.89	General Populations & Clinical Samples

Qualitative Self Report

Open Ended Questions

1. Describe today's laughter yoga session in about 140 characters or less (like a tweet)
2. List any feelings that you are aware of now that today's laughter yoga session has ended.
3. List any sensations you are aware of now that today's laughter yoga session has ended.
4. Describe how participation in laughter yoga affected you and those around you during the two weeks you were attending sessions.

Data Analysis

- Physiologic Data
 - Independent Samples and Paired t test
 - Repeated Measures ANOVA
- Self Report Scores
 - Mann-Whitney U
 - Wilcoxon Signed Rank
- Participant Open Responses
 - Content Analysis

Results of Analysis for Physiologic Measures

- Friedman's test indicate significant difference for:
 - STD HR ($X^2 (5, n = 32) = 14.05, p = .015$)

Inspection of median values showed decrease from baseline ($Md = 4.99$) to T2 ($Md = 4.15$) which appeared to recover by post-intervention ($Md = 4.89$)
 - PEFR ($X^2 (5, n = 41) = 184.26, p < .001$)

Inspection of median values showed decrease from baseline ($Md = 463.33$) to T2 ($Md = 317.16$) which increased by post-intervention ($Md = 480$)

Results of Analysis for Self Report Measures

- Sample: 43 volunteer military graduate students
 - 41 retained: Ex. Group (n = 20); WLC (N = 21)
- Mann Whitney U Results

Results of Self-Report Measure Change Score Comparison of Experimental and Wait-Listed Control (WLC) Group

Variable	N	Md	Mann Whitney U	Test Statistic (Z)	p (<.05)	Effect Size (r)
Positive Affect			147.5	-1.633	<u>< .005*</u>	.26
Experimental Group	20	<u>25.5</u>				
WLC Group	21	2				
SF 36 Role Emotional			147.5	-1.633	<u>.046*</u>	.26
Experimental Group	20	<u>8.33</u>				
WLC Group	21	-8.34				
SF 36 Mental Health			320.5	2.91	<u>.033*</u>	.45
Experimental Group	20	<u>5</u>				
WLC Group	21	0				
SF36 Physical			100	-2.695	<u>< .005*</u>	.42
Component Summary						
Experimental Group	20	<u>-.27</u>				
WLC Group	21	2.14				

Note. Results of Mann Whitney *U* analyses. *N* = number of subjects in each group; *Z* = *Z* score; *Indicates significant finding, $p \leq .05$; *r* = measure of effect size, using Cohen (1988) criteria of .1 = small effect, .3 = medium effect, and .5 = large effect.

Results of Analysis for Self Report Measures

Wilcoxon Signed Rank Test Results

Results of Self-Report Measure Change Score Analysis

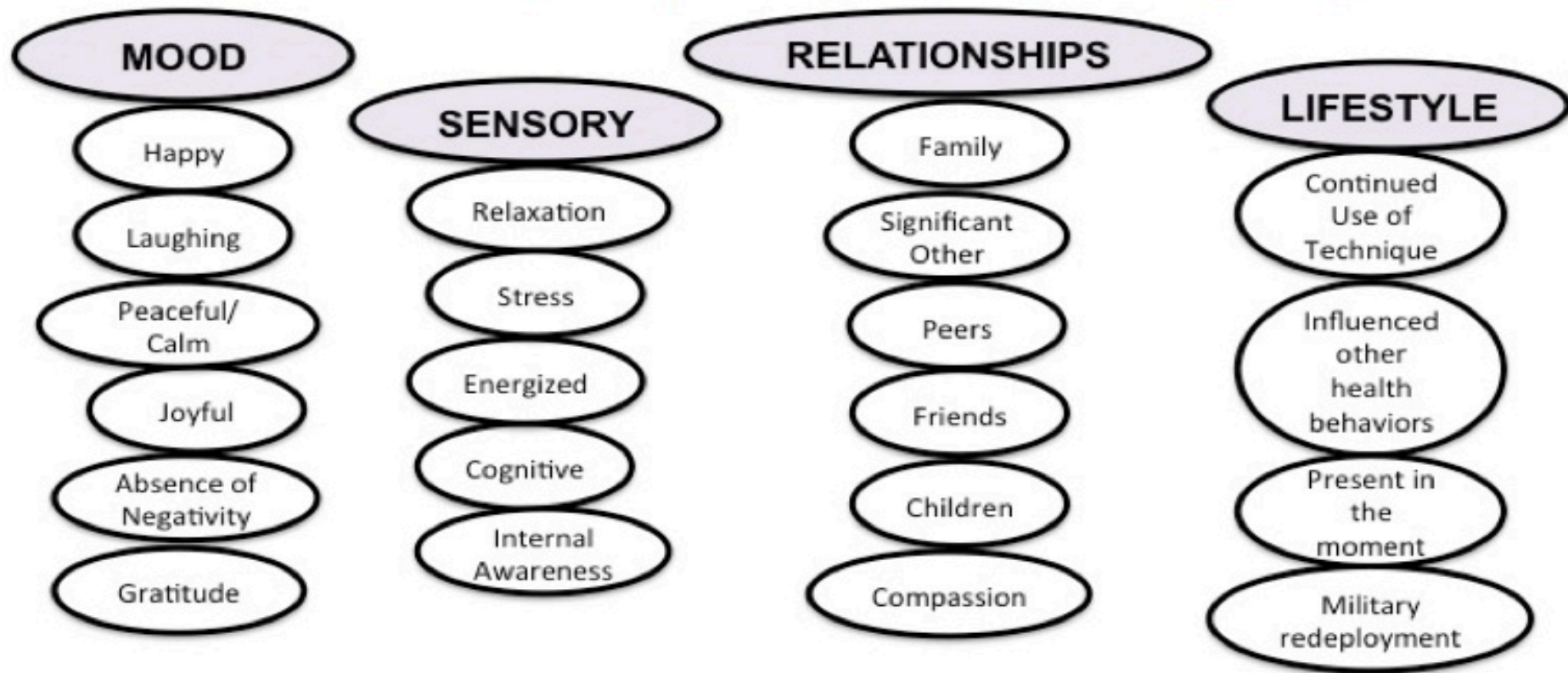
Variable	<i>N</i>	Test Statistic (<i>z</i>)	<i>p</i> ($<.05$)	Observed Median	Effect Size (<i>r</i>)	% Score Change Decrease / Increase
Perceived Stress Scale	41	.091	.928	0	.01	45% / 46%
Positive Affect Score	41	4.369	<u>$<.005^*$</u>	11	.48	29% / 66%
Negative Affect Score	41	-1.789	.074	-1	.01	76% / 17%
PHQ 8 Score	41	-1.154	.248	0	.18	46% / 34%
SF 36 Role Physical Score	41	1.994	<u>.046*</u>	0	.22	17% / 32%
SF 36 General Health Score	41	2.137	<u>.033*</u>	5	.24	16% / 60%
SF36 Mental Composite Score	41	5.484	<u>$<.005^*$</u>	12.9	.61	2% / 98%
Connor Davidson Resilience Scale	41	2.158	<u>.031*</u>	2	.24	27% / 66%

Note. Results of Wilcoxon Signed Rank analyses. *N* = number of subjects in each group; *Z* = *Z* score;

*Indicates significant finding, $p \leq .05$; *r* = measure of effect size, using Cohen (1988) criteria of .1 = small effect, .3 = medium effect, and .5 = large effect.

Results: Content Analysis of Participant Responses

Themes and Subthemes from Participant Responses Regarding the Impact of Laughter Yoga



Note. Main themes depicted in upper most touchstone shape with shaded background, subthemes of each main theme listed below each. Themes and subthemes derived from participant responses regarding how they were affected by participation in laughter yoga.

Participant Responses

- “Happy, joyful, optimistic.”
- “So much more relaxed and less stressed. I felt like I could better handle all of the things I have to do and study for school. I also felt extremely happy- it was very cathartic.”
- “Yes, noticed when I start feeling stress I smile, take a deep breath in and continue on in the "stressed" environment with a more relaxed attitude.”

Participant Responses

“As an introvert, it is difficult to "put myself out there". I think these sessions gave me an experience to help me personally deal with larger groups that I am unfamiliar with. I think this would have been a great experience for me during my redeployment reintegration after my Afghanistan tour.”

“I have started exercising more, I am eating better, I have stopped drinking alcohol, I drink less coffee, I sleep sounder/more and I am able to focus better. I think laughter yoga allowed me to think about my daily habits and compare the outcomes/consequences of my actions to the feeling I have following a LY session, thus I have made a few changes in my routines.”

Implications & Future Directions

- Results contribute to evidence regarding health benefits of LY participation
- Changes in psychological health indices suggest LY may provide a unique alternative that can aid in stress management
- Future directions:
 - Further study to determine effect of continued participation & to vary dose to determine dose effectiveness
 - Replication in other military populations



Namaste ☺

Questions?

Laughter Exercise Demo

(Time Permitting)



Contact Information:
Lt Col Jacqueline Killian
59 MDW/ST, JBSA-Lackland
jacqueline.m.killian.mil@mail.mil